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hydroxide, 500 mL of 25% aqueous ammonia. The solution is heated in a 2 L autoclave at 220° C. for 2 hrs to carry out the ammonolysis reaction.

HPLC and LC-MS analysis shows that the reaction solution is comprised of the following taurinates: sodium taurinate (76%), sodium ditaurinate (21%), and sodium tritaurinate (3%) on the molar basis.

Example 4

This example is directed to a process for the separation of taurine from sodium sulfate and from sodium ditaurinate and sodium tritaurinate.

A starting solution is prepared by first boiling the solution from the ammonolysis reaction to remove excess ammonia, and then adding enough sulfuric acid to pH 5-7. The solution is consisted of 30% taurine, 26% sodium sulfate, and 7% sodium di- and tri-taurinates.

2000 g of the starting solution is cooled from 80° C. to 33° C. to form a slurry consisting essentially of the first crop of crystallized taurine, which is separated by filtration at 33° C. and washed with 100 g of cold water. The recovered taurine is dried and weighed 398 g.

The separated mother liquor, weighed 1580 g, is boiled to evaporate to 900 g to form a slurry of sodium sulfate. This slurry is cooled to 80° C. and filtered to recover sodium sulfate, weighed 304 g.

The mother liquor, containing 202 g of taurine and 216 g of sodium sulfate, is cooled to 33° C. to form a second slurry of taurine. After filtration and washing with cold water, 124 g of taurine is obtained.

The mother liquor from the previous step, now containing 78 of taurine and 216 g of sodium sulfate, is cooled to 10° C. in 2 hrs to obtain slurry of taurine and Glauber's salt. The crystalline solid is obtained as a mixture of taurine and sodium sulfate decahydrate.

This final mother liquor, about 500 g, is consisted of sodium ditaurinate and tritaurinate (28%, 140 g), taurine (24 g, 4.8%), and sodium sulfate (35 g, 7%). This solution is used for the ammonolysis reaction.

It will be understood that the foregoing examples, explanation, drawings are for illustrative purposes only and that

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in view of the instant disclosure various modifications of the present invention will be self-evident to those skilled in the art and are to be included within the spirit and purview of this application and the scope of the appended claims.

What is claimed is:

1. A process for the production of taurine from alkali ditaurinate or alkali tritaurinate, or their mixture, comprising,

(a) adding an alkali hydroxide to a solution of alkali ditaurinate, or alkali tritaurinate or their mixture, to prepare a solution of dialkali ditaurinate, or trialkali tritaurinate or their mixture,

(b) adding an excess amount of ammonia to a solution of dialkali ditaurinate, or dialkali tritaurinate, or their mixture, and subjecting the solution to ammonolysis reaction to yield a mixture of alkali taurinates,

(c) removing excess ammonia from (b) and neutralizing alkali taurinates with an acid to form a crystalline suspension of taurine, and

(d) recovering taurine by means of solid-liquid separation.

2. The process according to claim 1, wherein alkali ditaurinate and alkali tritaurinate are prepared from diethanolamine and triethanolamine, respectively.

3. The process according to claim 1, wherein alkali ditaurinate, alkali tritaurinate, and their mixture are the byproducts in the production of taurine by the ammonolysis reaction of alkali isethionate or alkali vinyl sulfonate.

4. The process according to claim 1, wherein the catalysts for the ammonolysis reaction are sodium hydroxide, potassium hydroxide, lithium hydroxide, sodium carbonate, potassium carbonate, lithium carbonate, sodium sulfate, sodium sulfite, potassium sulfate, and potassium sulfite.

5. The process according to claim 1, wherein alkali metals are lithium, sodium, and potassium.

6. The process according to claim 1, wherein the acids are sulfuric acid, hydrochloric acid, nitric acid, hydrobromic acid, sulfurous acid, sulfur dioxide, and carbon dioxide.

7. The process according to claim 1, wherein the ammonolysis reaction is carried out at a temperature from 150 to 280° C. and under a pressure from autogenous to 260 bar.

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